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(54) **Mattress with spring core**

(57) Mattress having a top panel (1) and a bottom panel (2) made from a flexible material, in particular from foam material, and having wooden coil springs (6), in particular rattan springs, arranged between these top and bottom panels. According to the invention, at least one piece of latex foam is provided between the said wooden springs (6) at least in one zone of the mattress which is subjected to relatively heavy loads, and in par-

ticular in the shoulder and/or pelvis zone. Preferably, a plurality of small latex foam blocks (7) are provided in this zone, both these small blocks (7) and the wooden springs (6) being arranged in interconnected pockets. The presence of the small latex foam blocks has a beneficial effect on the fatigue properties of the mattress and, more specifically, the formation of hollows is counteracted.

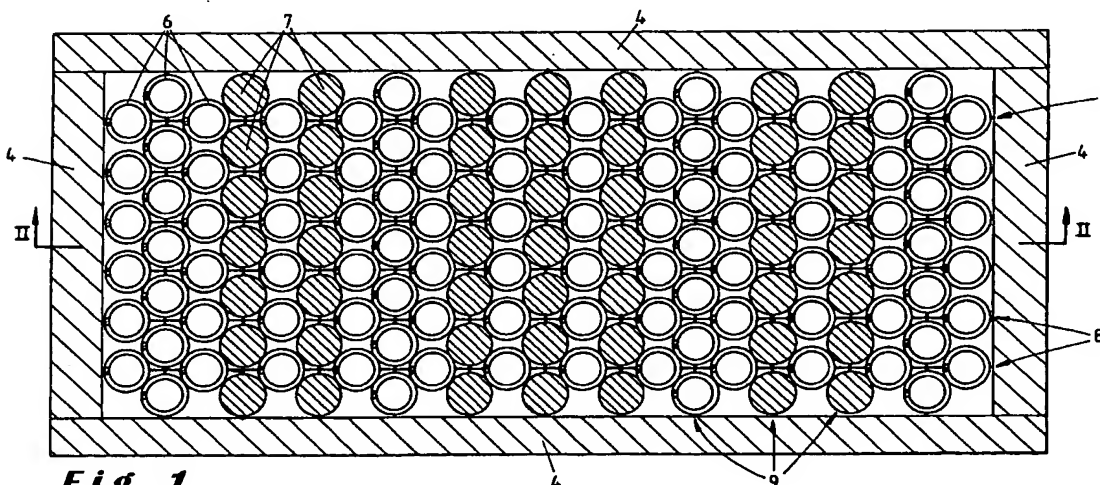


Fig. 1

Description

[0001] The present invention relates to a mattress having a top panel and a bottom panel made from a flexible material, in particular from foam material, and having wooden coil springs arranged between these top and bottom panels.

[0002] A mattress of this nature is known from EP-B-0,694,272, DE-A-195 33 698 and DE-U-296 12 307. In the known mattresses, use is in each case made of rattan springs. A drawback of these springs is that they are somewhat susceptible to fatigue, resulting in loss of height and/or hardness. This means that after a certain time hollows will form in those zones of the mattress which are exposed to the greatest loads, more specifically in the shoulder zone and above all in the middle of the mattress, in the pelvis zone. To alleviate this situation, DE-U-296 12 307 proposes a special shape of the rattan springs, more particularly a double cone shape, with the smallest diameter of the spring located in the middle. However, this shape has still proven not sufficiently suitable for counteracting the formation of hollows. Moreover, rattan is a natural material, the properties of which, in particular the resilience properties, are difficult to control, and consequently may vary within broad limits. All this has repercussions for the comfort properties of the mattress.

[0003] The object of the invention is therefore to propose a mattress with a core of wooden springs, in particular a rattan spring core, which is less susceptible to fatigue phenomena than the known mattresses with rattan cores.

[0004] To this end, the mattress according to the invention is characterized in that at least one piece of latex foam is provided between the said wooden springs at least in one zone of the mattress which is exposed to relatively heavy loads.

[0005] Compared to rattan springs, latex foam offers the advantage that it has improved comfort properties and, above all, also a considerable ability to restore its shape. By arranging latex foam of this nature in the zone or zones which are exposed to relatively heavy loads, in particular in the pelvis and shoulder zones, the durability and comfort of the mattress are improved. In those zones where the pieces of latex foam are arranged, the rattan springs can be placed further apart, so that the hardness of the mattress does not become too great in these zones. In practice, a significant advantage of rattan spring mattresses is that they can be produced by completely ecologically sound and natural techniques. The special selection of latex foam, preferably virtually 100% natural latex, in the mattress according to the invention does not interfere with this important advantage, and consequently the mattress can still be produced in an ecologically sound and natural manner.

[0006] In the mattress according to the invention, the said piece of latex foam may extend virtually from one longitudinal side of the mattress to the other longitudinal

side thereof. In a preferred embodiment of the mattress according to the invention, however, a plurality of small latex foam blocks are arranged between the wooden springs in the said zone of the mattress which is subjected to relatively heavy loads, the wooden springs and the small foam blocks preferably being arranged in interconnected pockets. In this way, a so-called pocket spring mattress is obtained, having a better point elasticity and therefore also an improved feeling of comfort.

[0007] Further advantages and particular features of the invention will emerge from the following description of a preferred embodiment of the mattress according to the invention. However, this description is given purely by way of example and is not intended to limit the scope of protection as defined by the claims. The reference numerals given in the description relate to the appended drawings, in which:

Figure 1 diagrammatically depicts a horizontal cross section through a mattress according to the invention;

Figure 2 diagrammatically depicts a vertical cross section on line II-II in Figure 1, the pockets around the springs not being shown for the sake of clarity; and

Figure 3 shows a detail of the right-hand end of the cross section shown in Figure 2, the pockets around the springs again having been omitted for the sake of clarity.

[0008] The mattress according to the invention which is illustrated in the figures comprises firstly a top panel 1 and a bottom panel 2 made from a flexible material. This flexible material may be a foam material, a fibrous material, such as coir, or a combination of the two. Preferably, the foam material of the top and bottom panels is a latex foam, more specifically virtually 100% natural latex, in such a manner that a mattress which can be produced in a completely natural and ecologically sound manner is obtained. Bars 3 made from the same material as the top panel 1 and the bottom panel 2 are provided at the edges of the mattress. In the embodiment shown in Figure 3, these bars 3 comprise a middle layer 4 of latex foam, on the top and bottom of which a layer of coir 5 is arranged. These coir layers 5 are intended to strengthen the edges of the mattress, in view of their greater hardness. If appropriate, they may cover the entire surface of the mattress and thus form part of the top panel 1 and the bottom panel 2.

[0009] Within the frame formed by the bars 3, wooden coil springs 6, more specifically rattan springs, although other types of wood, such as for example willow, could also be used, are arranged between the top panel 1 and the bottom panel 2. These springs 6 may, for example, be held in place by providing a reinforcement grid which is composed of slats, as described in EP-B-0,694,272, at the top and bottom. A similar reinforcement grid can be obtained by the coir layers 5 running, for example,

over the entire surface of the mattress. The springs can then be secured in holes in the coir layers 5 and/or can be fixed to the coir layers 5 by means of threads. Preferably, the rattan springs 6, as will be described in more detail below, are held in place by a reinforcing grid of pockets which are attached to one another.

[0010] According to the invention, it is essential that at least one piece of latex foam is provided between the wooden springs in at least one zone of the mattress which is subjected to relatively heavy loads. Those zones of the mattress which are subjected to relatively heavy loads are primarily the pelvis zone in the centre of the mattress and the shoulder zone or zones closer to the ends of the mattress. The most significant advantage of arranging one or more pieces of latex foam in these zones is that the durability of the mattress is considerably increased and, more specifically, the formation of hollows is counteracted. The latex foam also has a beneficial effect on the comfort of the mattress. To guarantee the same level of hardness in the zones where the latex foam is arranged, the springs 6 in this zone obviously have to be placed further apart.

[0011] In the simplest embodiment of the mattress according to the invention, one or more bar-like pieces of latex foam which extend over the entire width of the mattress between the longitudinal bars 3 can be arranged between the springs 6. This embodiment has not been illustrated in the figures. This is because, according to the invention, it is preferable to arrange smaller pieces or small blocks of latex foam 7 between the springs 6. These small blocks 7 may in particular be cylindrical or in the form of a double cone, with, for example, approximately the same dimensions as the springs 6, in such a manner that a number of springs can be replaced by small foam blocks 7 of this nature. To secure the small foam blocks 7 they may, for example, be glued securely to the top panel 1 and the bottom panel 2.

[0012] In the preferred embodiment shown in the figures, the small latex blocks or cylinders 7, like the rattan springs 6, are in each case arranged in strips of interconnected pockets, in such a manner that a pocket spring mattress is obtained, having improved comfort properties and, in particular, an improved point elasticity. According to the known techniques, the strips of pockets may, for example, be glued or sewn together. However, according to the invention it is preferable to use longitudinal strips 8 and transverse strips 9 of interconnected pockets. In this case, gaps are provided between the pockets of the longitudinal strips 8, in such a manner that the transverse strips 9 can be woven into these longitudinal strips 8. Conversely, the transverse strips 9 could also be provided with gaps, in such a manner that the longitudinal strips 8 can be woven into these transverse strips 9. This technique is described in more detail inter alia in EP-B-0,545,956.

[0013] As shown in Figure 1, for example, eleven transverse strips 9 of pockets are woven into five longitudinal strips 8, but it will be clear that these numbers

may vary according to the dimensions of the mattress and of the springs 6. In Figure 1, the pockets of the longitudinal strips 8 are all filled with rattan springs 6. The pockets of a number of transverse strips 9 are likewise filled with rattan springs 6, but a further number of these transverse strips 9 are filled with small latex blocks 7. Starting from the head end of the mattress, more specifically in Figure 1 the second and third transverse strips, the fifth, sixth and seventh transverse strips and the ninth and tenth transverse strips are filled with small latex blocks. These strips which are filled with small latex blocks are therefore located in the shoulder zone, the pelvis zone and in the zone which is symmetrical with respect to the shoulder zone, i.e. in the shoulder zone once again if the mattress is turned round. If appropriate, it would also be possible for only one and two strips filled with small latex blocks to be provided in the shoulder zone and the pelvis zone, respectively.

[0014] If Figure 1 is considered, it is possible to see a total of 23 transverse rows containing springs or small latex blocks. Since there are no small latex blocks in the longitudinal strips, the transverse rows of pockets filled with small latex blocks are each separated from one another by at least one transverse row of pockets filled with rattan springs. To avoid this, it would also be possible to arrange small latex blocks in some pockets of the longitudinal strips 8, but this makes the production process more complex. Moreover, it is preferable to maintain the sprung effect of the rattan springs even in the zones which are subjected to relatively heavy loads. Between each of the zones which are subjected to relatively heavy loads, there is preferably at least one transverse strip which is filled with rattan springs, arranged in such a manner that in total in each case preferably at least three rows of pockets filled with rattan springs are present between these zones. This is the case, for example, in the embodiment shown in Figure 1.

[0015] In order to be able to adjust the hardness of the mattress in the zone or zones which are subjected to relatively heavy loads, it is possible to utilize different hardnesses of latex foam. On the other hand, arranging the small latex blocks in pockets has the advantage that the small latex blocks can be arranged under a prestress in the pockets, i.e. in a partially compressed state, in such a manner that the hardness of these small blocks is increased.

[0016] Finally, it should also be noted that in the transverse strips 9 which are filled with small latex blocks, it is not necessarily the case that all the pockets have to be filled with small blocks of this nature. For example, one could consider, for example in Figure 1, filling only the five middle pockets with small latex blocks, and filling the pockets located at the longitudinal edges of the mattress with rattan springs. This is because the mattress is generally subjected to lower loads at the longitudinal edges than in the middle.

[0017] It will be clear from the description given above that the invention is in no way limited to the embodi-

ments described and that all kinds of amendments can be made to these embodiments, provided that they fall within the scope of protection covered by the appended claims.

Claims

1. Mattress having a top and a bottom panel made from a flexible material, in particular from foam material, and having wooden coil springs arranged between these top and bottom panels, characterized in that at least one piece of latex foam is provided between the said wooden springs at least in one zone of the mattress which is exposed to relatively heavy loads. 5
2. Mattress according to Claim 1, characterized in that the said springs are made from rattan. 10
3. Mattress according to Claim 1 or 2, characterized in that the said bottom and top panels are made from latex and/or coir. 15
4. Mattress according to one of Claims 1 to 3, characterized in that the said piece of latex foam extends virtually from one longitudinal side of the mattress to the other longitudinal side thereof. 20
5. Mattress according to one of Claims 1 to 3, characterized in that a plurality of small latex foam blocks are arranged between the wooden springs in the said zone of the mattress which is subjected to relatively heavy loads. 25
6. Mattress according to Claim 5, characterized in that the said springs and the said small foam blocks are arranged in interconnected pockets. 30
7. Mattress according to Claim 6, characterized in that the said pockets are arranged in longitudinal and transverse rows, the pockets in a number of transverse rows being filled with wooden springs and those in a further number of transverse rows, lying in the abovementioned zone which is exposed to relatively heavy loads, being at least partially filled with small latex foam blocks. 35
8. Mattress according to Claim 7, characterized in that at least two, and preferably at least three, transverse rows comprising pockets filled with small latex foam blocks are provided virtually in the centre of the mattress, more specifically in the pelvis zone. 40
9. Mattress according to Claim 7 or 8, characterized in that at least one, and preferably at least two, transverse rows comprising pockets filled with small latex foam blocks are provided in the shoulder zone 45

of the mattress, the mattress preferably being of symmetrical structure, so that at least two transverse rows comprising pockets filled with small latex foam blocks are likewise provided on the other side of the mattress, at the same distance from the longitudinal end.

10. Mattress according to Claims 8 and 9, characterized in that at least three transverse rows comprising pockets filled with wooden springs are in each case provided between the transverse rows comprising pockets filled with small latex foam blocks of the pelvis zone and the transverse rows comprising pockets filled with small latex foam blocks of the shoulder zone. 50
11. Mattress according to one of Claims 7 to 10, characterized in that the said transverse rows comprising pockets filled with small latex foam blocks are in each case separated from one another by at least one transverse row comprising pockets filled with wooden springs. 55
12. Mattress according to Claim 11, characterized in that the said pockets are attached to one another in strips, which strips extend in the longitudinal and transverse directions of the mattress, the transverse strips being woven into the longitudinal strips or, conversely, the longitudinal strips being woven into the transverse strips.
13. Mattress according to one of Claims 6 to 10, characterized in that at least a number of the said small foam blocks are positioned in a prestressed state in the pockets.

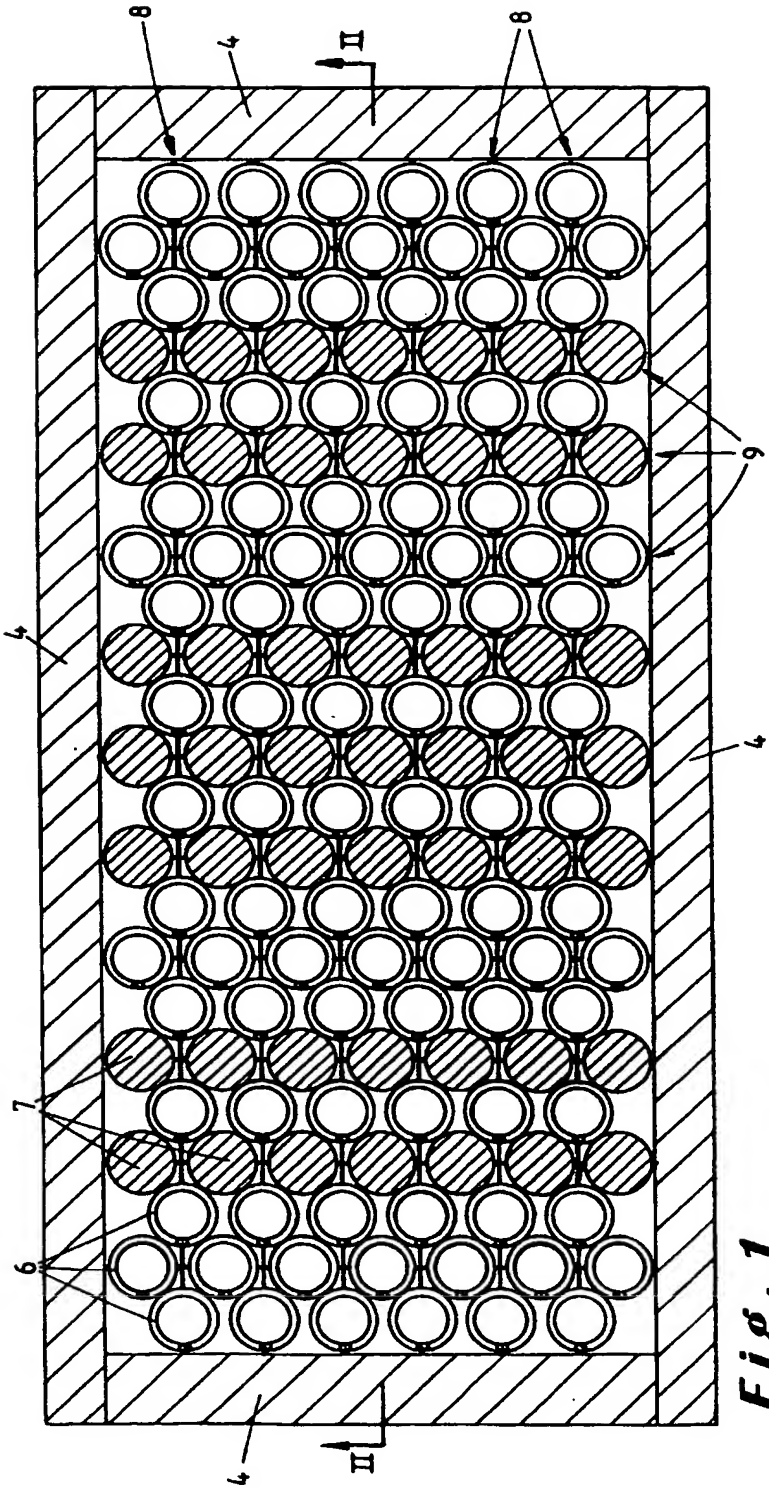


Fig. 1

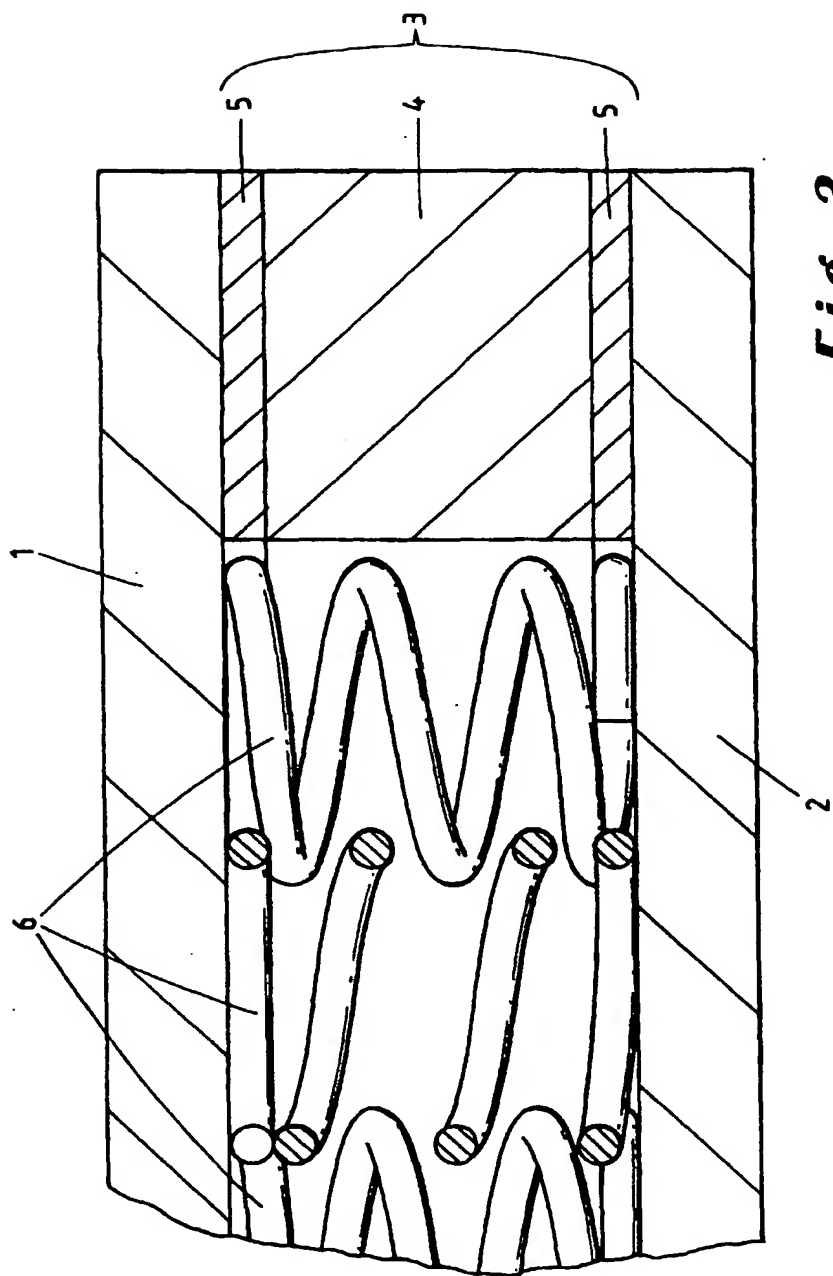


Fig. 3



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 00 87 0079

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
D, Y	EP 0 694 272 A (POLUS MICHAEL) 31 January 1996 (1996-01-31) * page 2, right-hand column, line 18-41; figures 1,2 *	1-6	A47C27/04 A47C27/06
A	---	7,11,13	
Y	US 5 469 590 A (SIMON LEROY J) 28 November 1995 (1995-11-28) * abstract; figures 2,4-6 *	1-6	
A	* column 6, line 13-20 *	8-11	
A	DE 25 38 725 A (LIEBERKNECHT A) 10 March 1977 (1977-03-10) * page 9, line 15-21 * * page 11, line 17 - page 12; figures 4,9 *	1,8-11	
D, A	EP 0 545 956 A (HUSER SCHLARAFFIA WERKE) 16 June 1993 (1993-06-16) * figure 4 *	12	
A	EP 0 180 244 A (LIEBERKNECHT A) 7 May 1986 (1986-05-07) * abstract; figure 1 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7) A47C
A	DE 93 16 223 U (SCHLUETER JUERGEN) 24 November 1994 (1994-11-24) * figure 1 *	8	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 3 August 2000	Examiner van Bilderbeek, H.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 87 0079

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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03-08-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0694272 A	31-01-1996	DE 9411638 U	23-11-1995
		AT 175549 T	15-01-1999
		CA 2153616 A	20-01-1996
		DE 59504787 D	25-02-1999
		ES 2127971 T	01-05-1999
		US 5596777 A	28-01-1997
US 5469590 A	28-11-1995	NONE	
DE 2538725 A	10-03-1977	NONE	
EP 0545956 A	16-06-1993	DE 4026502 C	06-06-1991
		DE 4040220 A	17-06-1992
		DE 4042304 A	02-07-1992
		AT 394938 B	27-07-1992
		AT 207190 A	15-01-1992
		AT 106687 T	15-06-1994
		AU 645833 B	27-01-1994
		AU 8326691 A	17-03-1992
		CA 2089485 A	23-02-1992
		CH 681773 A	28-05-1993
		WO 9203077 A	05-03-1992
		DE 59101895 D	14-07-1994
		DK 545956 T	22-08-1994
		ES 2055612 T	16-08-1994
		JP 2981685 B	22-11-1999
		JP 6500027 T	06-01-1994
		US 5319815 A	14-06-1994
EP 0180244 A	07-05-1986	DE 3440045 A	07-05-1986
		DE 3538270 A	30-04-1987
		AT 47018 T	15-10-1989
		DE 3573522 D	16-11-1989
		DE 3637448 A	05-05-1988
DE 9316223 U	24-11-1994	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82